"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

ANDRONNIKOV, K.S.; BALAKOV, V.V.; BUZHINSKIY, A.N.; BURAGO, A.N.; VENTMAN, L.A.; VISHNEVSKIY, A.A.; VOLOSOV, D.S.; GASSOVSKIY, L.N., professor; GERSHUN, A.A., professor; YEL'YASHEVICH, M.A.; YEVSTROP'YEV, K.S.; GUREVICH, M.M., professor; KOLYADIN, A.I.; KORYAKIN, B.M.; KURITSKIY, A.L.; PAPIYANTS, K.A.; PROKOF'YEV, V.K., professor; PUTSEYKO, Ye.K.; REZUNOV, M.A.; RITYN', N.E., SAVOST'YANOVA, M.V., professor; SEVCHENKO, A.N.; SENNOV, N.I.; STOZHAROV, A.I.; FAYERMAN, G.P., professor; FEOFILOV, P.P.; TSAREVSKIY, Ye.N., professor; CHEKHMATAYEV, D.P.; YUDIN, Ye.F.; KAVRAYSKIY, V.V., professor; VAVILOV, S.I., akademik, redaktor

[Optics in military science] Optika v voennom dele; sbornik statei. Pod red. S.I.Vavilova i M.V.Savost'ianovoi. Izd. 3-e, zanovo perer. i dop. Moskva. Vol.2. 1948. 387 p. (MLRA 9:9)

1. Akademiya nauk SSSR. 2. Sostaviteli - sotrudniki Gosudarstvennogo Opticheskogo instituta (for all except Vavilov and Kavrayskiy) 3. Voyenno-morskaya akademiya (for Kavrayskiy)
(Optics)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SENNOV, N.I.

Characteristics of foreign field glasses. Opt.-mekh.prom. 25 no.4:31-38 Ap '58. (MIRA 11:10)
(Field glasses)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

L 5106-66 EWT(1)/FCC GW/BC

ACC NR: AP5025730 SOURCE CODE: UR/0286/65/000/018/0082/0082

AUTHORS: Shevchenko, F. N.; Sennov, N. S. 44,55 44,55

ORG: none

59
B

TITLE: A method for vertical sounding of atmosphere. Class 42, No. 174814 /Scientific Research Institute of Hydrometeorological Instrument Construction (Nauchno-issledovatel'skiy institut gidrometeorologicheskogo priborostroyeniya)/ 44,55

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 18, 1965, 82

TOPIC TAGS: atmospheric probe, 12, 44,55 atmospheric sounding, atmospherics, radar range-finding, radar system, meteorologic radar 12, 44,55

ABSTRACT: This Author Certificate presents a method for vertical sounding of the atmosphere. The equipment contains a radiosonde with a meteorological unit, a radio transmitter-receiver, an earth-based radar unit, and an automatic recorder (see Fig. 1). To increase the accuracy of determining the distance to the radiosonde, to extend the operating radius, and to simplify the design, the range finding circuit of the radar unit is supplemented with a converter. The converter

Card 1/2

UDC: 551.508.822

090/0948

Card 2/2 MD

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SENNOVA, V.F.

Guide complexes of spores in the Upper Devonian sediments of the Timan-Pechora area and the Bol'shezemel'skaya Tundra region. Dokl. AN SSSR 163 no.1:175-178 Jl '65. (MIRA 18:7)

1. Submitted February 5, 1965.

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

L 25962-66 EWT(1) GW

ACC NR: AP6002277 (A) SOURCE CODE: UR/0412/65/000/011/0024/0024

AUTHOR: Senokosov, V. (Engineer) 27 AB

Org: Saratov Chemical Combine (Saratovskiy khimicheskiy kombinat)

TITLE: Soil compaction by puddling

SOURCE: Na stroykakh Rossii, no. 11, 1965, 24

TOPIC TAGS: structural engineering, soil mechanics 12

ABSTRACT: The author describes a soil stabilization method used at the construction site of the Saratov Chemical Combine. The soil belonged to the second class of loosely packed soils with a settlement depth up to 12 m. The method of puddling was used to replace previous mechanical compaction by means of heavy tampers. The method consisted of filling the construction pit with water up to a 1.5-m level over the pit base mark. The water was kept at 1 to 1.5 m level by continuously adding water to compensate the effect of seepage. This process was continued until a soil settlement of 25 to 30 cm was attained, usually after 7 to 14 days. In the next 2 or 3 days, the

Card 1/2 2

Card 2/2 FW

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SENOTRUSOVA, V.N.

Gamasid mites parasitic on the vole Ellobius talpinus in the environs of Alma-Ata. Trudy Inst.zool.AN Kazakh.SSR. 12:206-209 '60. (MIRA 13:7)
(Alma-Ata region--Mites)
(Parasites--Field mice)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SENOTRUSOVA, V.N.

Abundance of the mite Hirstionyssus meridianus Zemsk., 1955 on the tamarisk gerbil (Meriones tamariscinus). Trudy Inst. zool. AN Kazakh. SSR 14:177-179 '60. (MIRA 13:12)
(Alma-Ata region--Mites)
(Parasites--Gerbils)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEMOTHOVA, V.N.

Morphology of deutonymphs of the gamasid mite Hirstionyssus meridianus Zemsk., 1955. Trudy Inst. zool. AN Kazakh. SSR 9:146-148 '58. (MIRA 11:7)

(Mites) (Insects--Development)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SENOTRUSOVA, V.N.

Biology of the gamasid mite Hirstionyssus meridianus Zemsk.
Trudy Inst. zool. AN Kazakh. SSR 9:149-152 '58. (MIRA 11:7)
(Alma-Ata Province--Mites)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SENOTRUSOVA, V. N.

Materials on the biology of the gamasid mite Hirstionyssus meridianus Zem., 1951. Trudy Inst. zool. AN Kazakh. SSR 16: 192-199 '62. (MIRA 15:10)

(Kazakhstan—Mites)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

REMENTSOVA, M.M.; BUSALAYEVA, N.N.; BEZUKLADNIKOVA, N.A.; SENOTRUSOVA, V.N.

Experimental infection of Gamasid ticks, fleas, lice, and bed bugs with brucellosis. Preliminary report. Trudy Inst.kraev.pat.AN Kazakh SSR 12:47-54 '62. (MIRA 15:11)

1. Institut krayevoy patologii AN KazSSR i Institut zoologii AN KazSSR.

(TICKS AS CARRIERS OF DISEASE) (BRUCELLA)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SENOTRUSOVA, V.N.

Ecology of the gamasid mite Hirstionyssus meridianus Zemsk. (Parasitiformes, Gamasoidea). Trudy Inst. zool. AN Kazakh. SSR 19:191-197 '63. (MIRA 16:9)

(Alma-Ata region--Mites)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SENOTRUSOVA, V.N.

Fauna of Gamasid mites (Parasitiformes, Gamasoidea) of the tamarisk gerbil in the piedmont zone of the Trans-Ili Ala-Tau. Trudy Inst. zool. AN Kazakh. SSR 19:198-205 '63. (MIRA 16:9)
(Trans-Ili Ala-Tau--Mites)
(Trans-Ili Ala-Tau--Parasites--Gerbils)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

REMENTSOVA, M.M.; BEZUKLADNIKOVA, N.A.; BUSALAYEVA, N.N.; SENOTRUSOVA, V.N.

Experimental infection of gamasid mites, lice and fleas with Brucella. Trudy Inst. zool. AN Kazakh. SSR 19:226-233 '63. (MIRA 16:9)

(Insects as carriers of disease) (Brucella)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SENOTRUSOVA, V.N.

Prophylaxis of silicosis by A.P.Polosukhin's method. Vest. AN Kazakh. SSR 21 no.7:52-57 Jl '65. (MIRA 18:8)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

CENOV, I.

Mathematical Reviews
Vol. 14 No. 9
October 1953
Mechanics

Cenov, I. On a new form of the equations of analytic dynamics. Doklady Akad. Nauk SSSR (N.S.) 89, 21–24 (1953). (Russian)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

CENOV, I.

Mathematical Reviews
Vol. 14 No. 9
October 1953
Mechanics

Cenov, I. On some transformations of the equations of motion and on geodesic trajectories of mechanical systems. Doklady Akad. Nauk SSSR (N.S.) 89, 225–228 (1953). (Russian)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SENOOV, B.

On a subcone of the cone of regularly monotonous functions, the signs of the derivatives of which vary periodically. p. 109.

GODISHNIK. MATERMATIKA I FIZIKA. Sofiia, Bulgaria, Vol. 50, no. 1 pt. 2. 1955/56 (published 1958)

Monthly List of East Accession (EEAI) LC, Vol. 9, No. 1 January 1960

Uncl.

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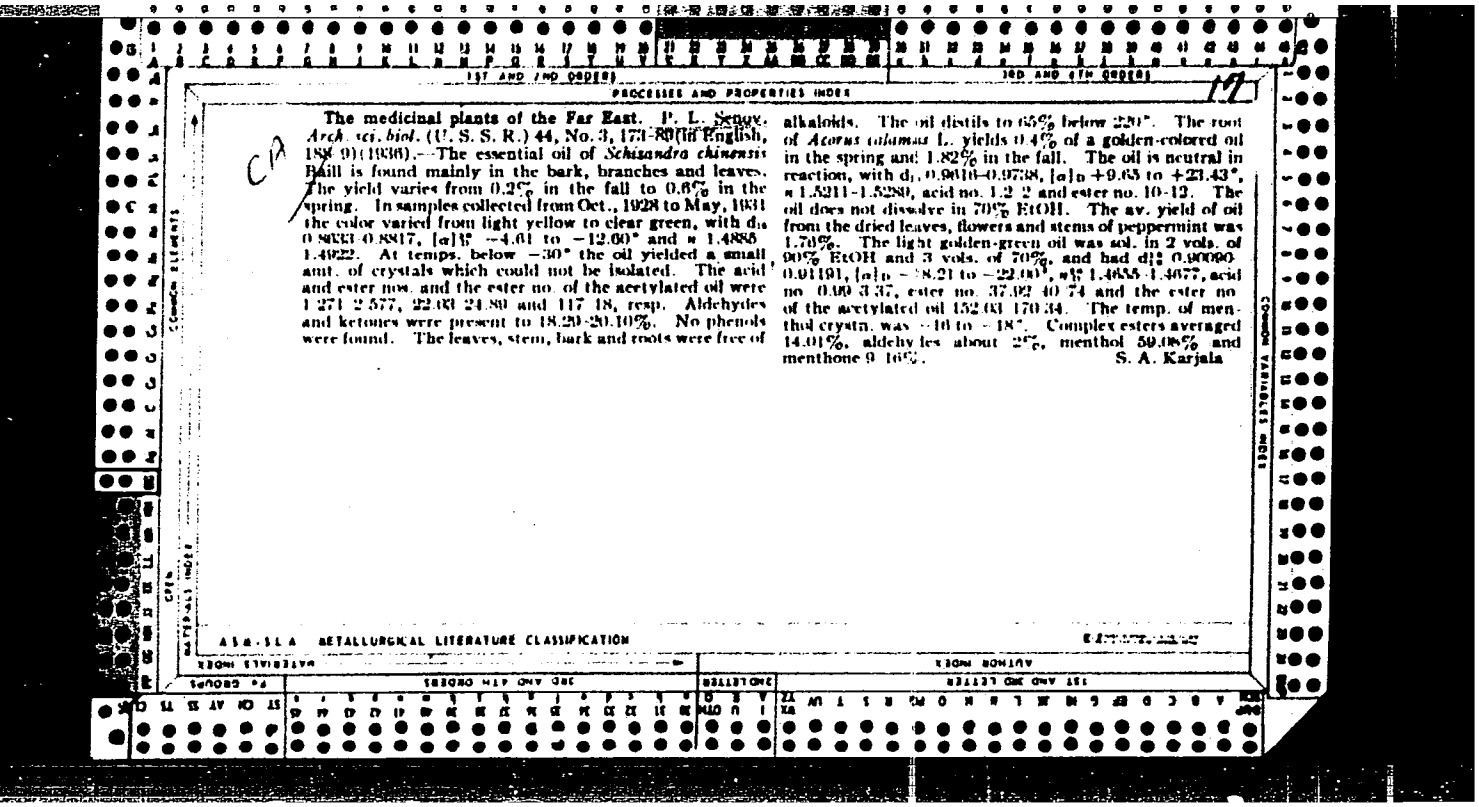

PROCESSES AND PROPERTIES INDEX

The medicinal plants of the Far East. P. L. Senov. *Arch. sci. biol.* (U. S. S. R.) 44, No. 3, 173-80 (in English, 188-9) (1936).—The essential oil of *Schisandra chinensis* Baill is found mainly in the bark, branches and leaves. The yield varies from 0.2% in the fall to 0.6% in the spring. In samples collected from Oct., 1928 to May, 1931 the color varied from light yellow to clear green, with d_{15} 0.8933-0.8817, $[\alpha]_D^{15}$ −4.61 to −12.60° and n 1.4885-1.4922. At temps. below −30° the oil yielded a small amt. of crystals which could not be isolated. The acid and ester nos. and the ester no. of the acetylated oil were 1.271-2.577, 22.03-24.80 and 117.18, resp. Aldehydes and ketones were present to 18.20-20.10%. No phenols were found. The leaves, stem, bark and roots were free of alkaloids. The oil distils to 65% below 220°. The root of *Acorus calamus* L. yields 0.4% of a golden-colored oil in the spring and 1.82% in the fall. The oil is neutral in reaction, with d_4^{15} 0.9010-0.9738, $[\alpha]_D$ +9.65 to +23.43°, n 1.5211-1.5280, acid no. 1.2-2 and ester no. 10-12. The oil does not dissolve in 70% EtOH. The av. yield of oil from the dried leaves, flowers and stems of peppermint was 1.70%. The light golden-green oil was sol. in 2 vols. of 90% EtOH and 3 vols. of 70%, and had d_4^{15} 0.90090-0.91191, $[\alpha]_D$ −18.21 to −22.03°, n_D^{15} 1.4635-1.4677, acid no. 0.89-3.37, ester no. 37.92-40.74 and the ester no. of the acetylated oil 152.03-170.34. The temp. of menthol crystn. was −10 to −18°. Complex esters averaged 14.01%, aldehydes about 2%, menthol 59.08% and menthone 9.16%. S. A. Karjala

A 54-54 A METALLURGICAL LITERATURE CLASSIFICATION

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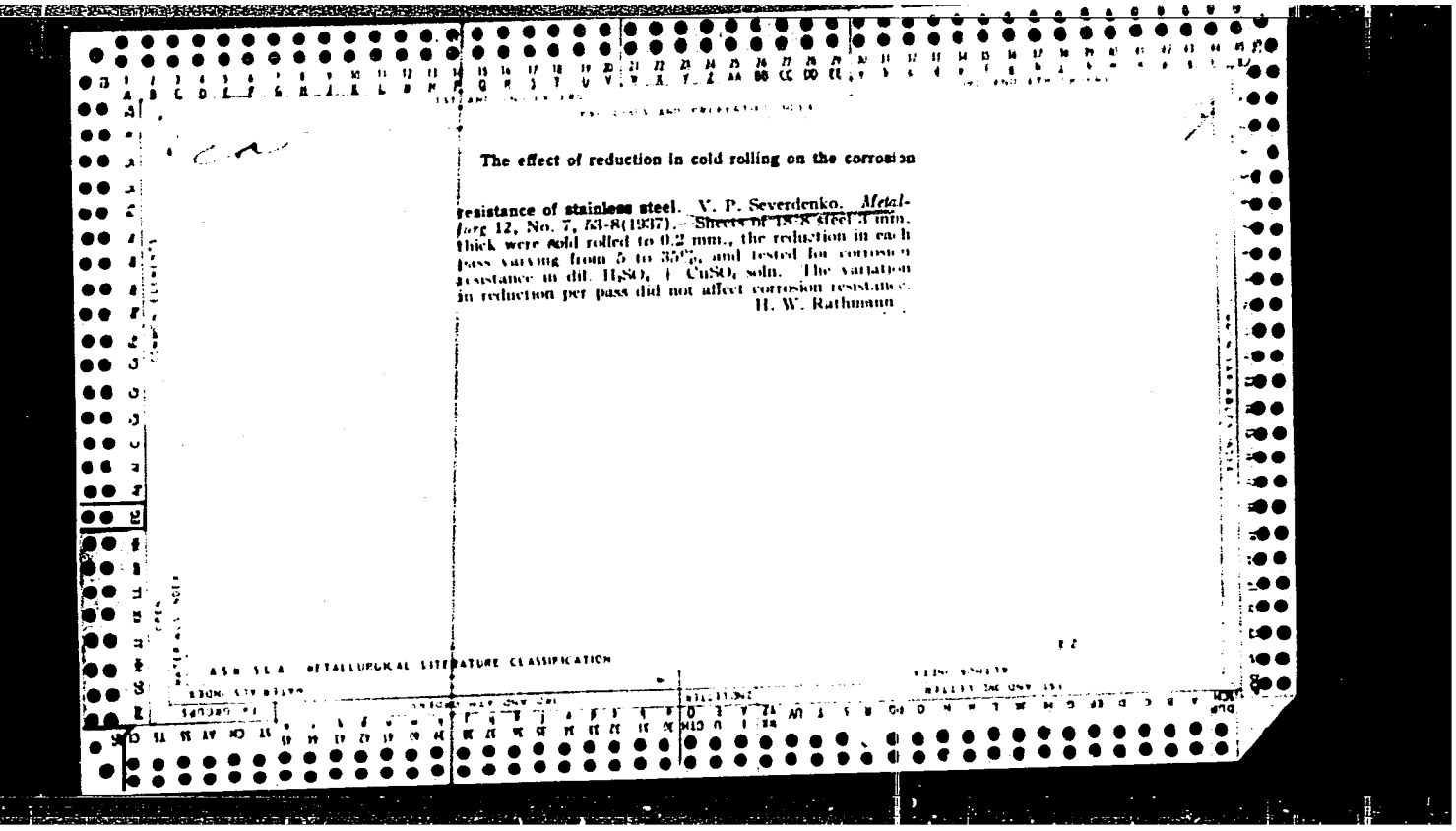

The effect of reduction in cold rolling on the corrosion resistance of stainless steel. V. P. Severdenko. *Metallurg* 12, No. 7, 53-8(1937).—Sheets of 18:8 steel 3 mm. thick were cold rolled to 0.2 mm., the reduction in each pass varying from 5 to 35%, and tested for corrosion resistance in dil. H_2SO_4 + $CuSO_4$ soln. The variation in reduction per pass did not affect corrosion resistance.
H. W. Rathmann

ASM STEEL METALLURGICAL LITERATURE CLASSIFICATION

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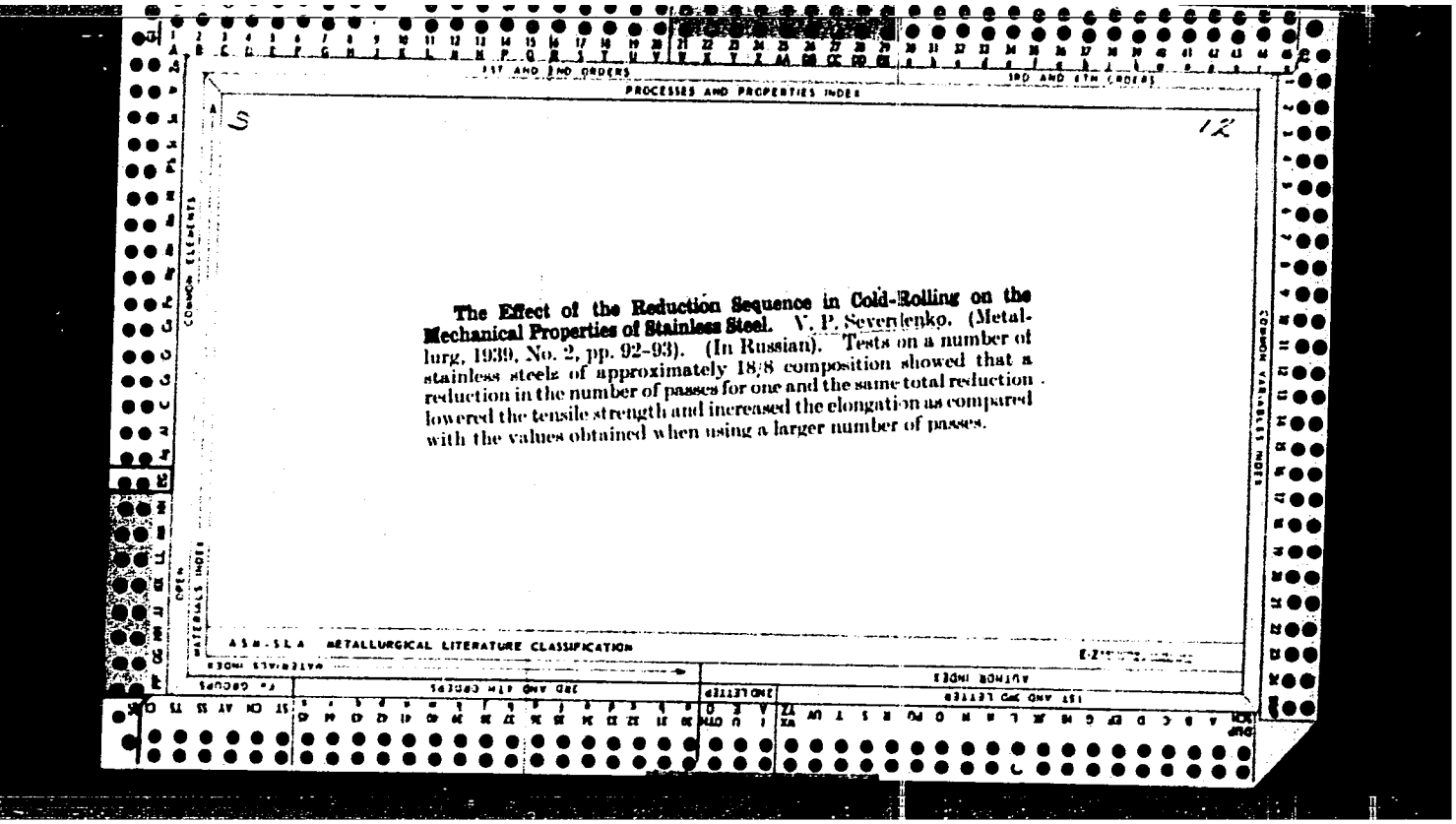

PROCESSES AND PROPERTIES INDEX

S

12

The Effect of the Reduction Sequence in Cold-Rolling on the Mechanical Properties of Stainless Steel. V. P. Severdenko. (Metallurg, 1939, No. 2, pp. 92–93). (In Russian). Tests on a number of stainless steels of approximately 18/8 composition showed that a reduction in the number of passes for one and the same total reduction lowered the tensile strength and increased the elongation as compared with the values obtained when using a larger number of passes.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

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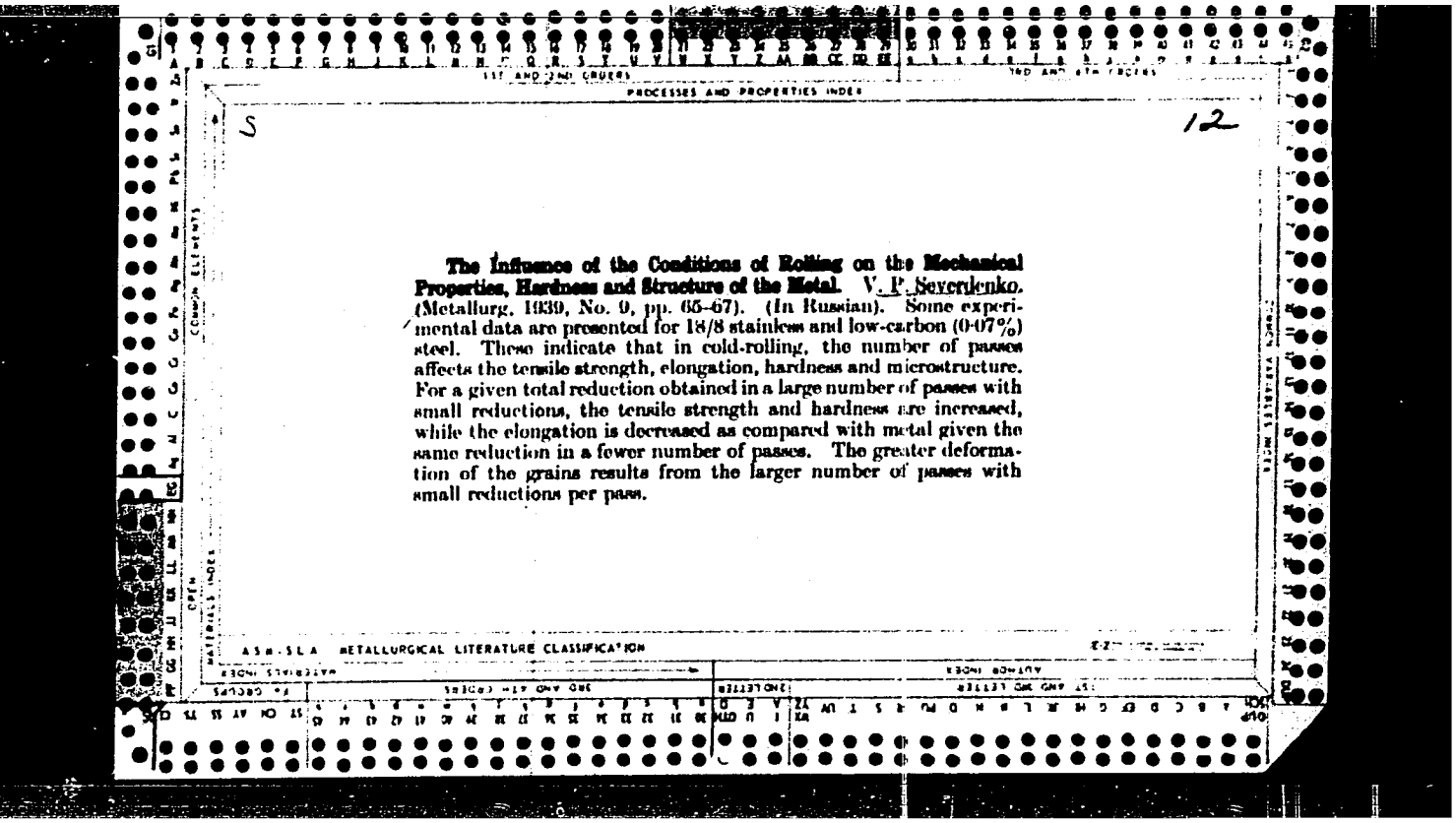

PROCESSES AND PROPERTIES INDEX

S

12

The Influence of the Conditions of Rolling on the Mechanical Properties, Hardness and Structure of the Metal. V. P. Severdenko. (Metallurg, 1939, No. 9, pp. 65–67). (In Russian). Some experimental data are presented for 18/8 stainless and low-carbon (0·07%) steel. These indicate that in cold-rolling, the number of passes affects the tensile strength, elongation, hardness and microstructure. For a given total reduction obtained in a large number of passes with small reductions, the tensile strength and hardness are increased, while the elongation is decreased as compared with metal given the same reduction in a fewer number of passes. The greater deformation of the grains results from the larger number of passes with small reductions per pass.

A S M - S L A METALLURGICAL LITERATURE CLASSIFICATION

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V. P. PA 19/49T65

USSR/Engineering Nov 48
Rolling
Concrete, Reinforced

"Rolling of Broken Profile Elements," V. P. Severdenko, Cand Tech Sci, K. K. Amosov, Engr, Moscow Steel Inst, 1½ pp

"Stal'" No 11

Describes method of calibrating rollers to produce periodic profiles. Method has been successfully used in laboratory. Recommended for industrial manufacture of steel rods with spiral or herringbone grooves for reinforcing concrete.

19/49T65

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.

Severdenko, V.P. "Forward flow, spreading, specific pressure and friction coefficient during cold rolling," report (Mosk. in-t stali im. Stalina) 26, 1948, p. 3-14

SO: U-2888, Letopis Zhurnal'nykh Statey, No. 1, 1949

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.

Severdenko, V.P. "Effect of external friction on specific gravity during cold rolling," report (Mosk. in-t stali im. Stalina) 26, 1948, p. 15-19

SO: U-2888, Letopis Zhurnal'nykh Statey, No. 1, 1949

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.

Severdenko, V.P. and Sartan, Ya. Kh. "On the recrystallization of steel," reprot (Mosk. In-t stale im. Stalina) 26, 1948, p. 38-42

SO: U-2888, Letopis Zhurnal'nykh Statey, No. 1, 1949

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.

"Pressure of Metal on Rolls in the Rolling Process." Thesis for degree of Dr. Technical Sci. Sub 1 Dec 49, Moscow Order of the Labor Red Banner Inst of Steel imeni I.V. Stalin.

Summary 82, 18 Dec 52, Dissertations Presented for Degress in Science and Engineering in Moscow in 1949. From Vechernyaya Moskva, Jan - Dec 1949.

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V. P.

Severdenko, V. P. and Garban, Ya. Kh. - "The influence of size reduction in drawing on the mechanical properties of the drawn product", Sbornik (Mosk. in-t stali im Stalina), 27, 1949, p. 210-13.

SO: U-3042, 11 March 53, (Letopis 'Zhurnal 'nykh Statey, No. 8, 1949).

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, Prof V. Oct 52

USSR/Metallurgy - Conservation of Metals, Rolling

"Application of New Economical Shapes in Rolling," Prof V. Severdenko, Dr Tech Sci

Za Ekon Materialov, No 3, pp 29-35

Discusses several types of rolled shapes, such as periodical, thin-walled, bent, and hollow sections, stating their use in industry makes possible considerable conservation of metal. Estimates saving of metal in machine building and construction works at 300,000-400,000 tons per year, but states that production of these shapes in USSR is far behind requirements.

Source #264T53

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P., professor, doktor; ASTAKHOV, I.G., dotsent, kandidat tekhnicheskikh nauk.

Resistance to deformation in hot rolling of thin steel strips. Sbor. Inst.stali no.31:212 '53. (MLRA 9:9)
(Rolling (Metalwork)) (Deformation (Mechanics))

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P., prof., doktor tekhn.nauk; ASTAKHOV, I.G., dots., kand.tekhn.nauk

Distribution of unit pressure along the contact surface in rolling circular cross-section rods with smooth rolls. Obr.met. davl. no.3:63-75 '54. (MIRA 12:10)
(Rolling (Metalwork))

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.

PAVLOV, I.M. professor, doktor tekhnicheskikh nauk; [illegible]DOSOV, N.M., SEVERDENKO, V.P.; TARNOVSKIY, I.Ya., redaktor; LANGE, B.L. OKHRIMENKO, Ya. M.; VALOV. N.A., redaktor; SHPAK, Ye.G., tekhnicheskiy redaktor.

[Press working of metals] Obrabotka metallov davleniem. Pod nauchnoi red. I.M.Pavlova. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 195[illegible]. 483 p. (MLRA 9:1)

1. Chlen-korrespondent AN SSSR (for Pavlov)
(Metalwork)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.

AKIMOVA, K.I.; BAZHENOV, M.F.; BAKHVALOV, G.T.; BEZKLUBENKO, N.P.; BERMAN, S.I.; BOGDANOV, Ye.S.; BODYAKO, M.N.; BOYKO, B.B.; VINOGRADOV, S.V.; GAGEN-TORN, K.V.; GLEK, T.P.; GOREV, K.V.; GRADUSOV, P.I.; GUSHCHINA, T.N.; YEMEL'YANOV, A.K.; YESIKOV, M.P.; ZDZYARSKIY, A.V.; ZAKHAROV, M.V.; ZAKHAROVA, M.I.: KARCHEVSKIY, V.A.; KOMAROV, A.I.; KORZHENKO, O.T.; LAYNER, V.I.; MAL'TSEV, M.V.; MILLER, L.Ye.; MILOVANOV, A.I.; MIRONOV, S.S.; NIKONOROVA, N.A.; OL'KHOV, N.P.: OSIPOVA, T.V.; OSOKIN, N.Ye.; PERLIN, I.L.; PLAKSIN, I.N.: PROKOF'YEV, A.D.; RUMYANTSEV, M.V.; SEVERDENKO, V.P.; SEREDIN, P.I.; SMIRYAGIN, A.P.; SPASSKIY, A.G.; TITOV, P.S.; TURKOVSKAYA, A.V.; SHAKHNAZAROV, A.K.; SHPICHINETSKIY, Ye.S.; YURKSHTOVICH, N.A.; YUSHKOV, A.V.; YANUSHEVICH, L.V.

Sergei Ivanovich Gubkin. TSvet.met. 28 no.6:60-61 N-D '55. (MIRA 10:11)
(Gubkin, Sergei Ivanovich, 1898-1955)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P., professor, doktor tekhnicheskikh nauk; ASTAKHOV, I.G., dotsent, kandidat tekhnicheskikh nauk.

Widening, forward flow, and specific pressure during cold rolling. Sbor.Inst.stali no.33:298-310 '55. (MLRA 9:6)

1. Kafedra prokatki. Predstavleno chlenom-korrespondentom AN SSSR I.M.Pavlovym.

(Rolling (Metalwork))

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDZENKA, V.P.

SEVERDZENKA, V.P.; GOREU, K.V.; BADZYAKA, M.N.; KANAVALAU, Ye.G.

Development of the metalworking industry in White Russia.
Vestsi AN BSSR Ser. fiz.-tekh. nav. no.3:21-31 '57.
(MIRA 11:1)

(White Russia--Machinery industry)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P., akademik, red.; KALACHEV, M.I., red.; YUSHKOV, A.V., red.; VOLK, A.A., red.; GURVICH, G.Ye., tekhred.

[Papers of the Conference on the Improvement of the Technology of the Working of Metals under Pressure] Materialy Konferentsii po usovershenstvovaniiu tekhnologii obrabotki metallov davleniem. Minsk, Izd-vo Belgosuniv. im. V.I.Lenina, 1958. 111 p. (MIRA 12:6)

1. Konferentsiya po usovershenstvovaniyu tekhnologii obrabotki metallov davleniyem.
(Metalwork--Congresses)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SOV/137-59-1718

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 1, p 227 (USSR)

AUTHOR: Severdenko, V. P.

TITLE: Problem Areas in the Field of Forging and Stamping (Zadachi v oblasti kovki-shtampovki)

PERIODICAL: V sb.: Materialy Konferentsii po usoversh. tekhnol. obrabotki metallov davleniyem. Minsk, Belorussk. un-t, 1958, pp 3-8

ABSTRACT: The author delineates the principal trends in the development of the forging and stamping industry. Essential data on improvements, as well as on fundamental process technologies, equipment, and integral mechanization and automatization of processes relating to the fabrication of forgings, are set forth.

M. Ts.

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SEVERDENKO, V.P.

"Theory of metal drawing" by I.L. Perlin. Reviewed by V.P. Severdenko. Izv. vys. ucheb. zav.; tsvet. met. no.2:184-185 '58. (MIRA 11:8)

(Drawing (Metalwork))
(Perlin, I.L.)

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66947
SOV/123-59-14-54880

25.1000

Translation from: Referativnyy zhurnal. Mashinostroyeniye, 1959, Nr 14, p 59 (USSR)

AUTHORS: Severdenko, B.P., Bogdanov, G.N.

TITLE: Obtaining Tubular Bodies by Way of Semi-Liquid Rolling

PERIODICAL: Sb. nauchn. tr. Fiz. tekhn. in-t, AS BSSR, 1958, Nr 4, pp 3 - 36

ABSTRACT: Installation and technology for the manufacture of tubular bodies by way of semi-liquid rolling are described. The pilot plant consists of a lathe, on the spindel of which a hollow mold is fitted, and on the carriage a revolving roller, driven by a separate electromotor. The pouring of the molten metal into the mold is carried out by a turning trough. The investigation of the process was effected with the aid of the Al-12 and Al-7 alloys of Al-Cu. The mechanical properties of the blanks obtained were determined by tests with micro-specimens; besides, the density, microstructure and macrostructure of the specimens were analyzed. The developed technology ensures a saving of metal of from 5 to 25% in comparison with centrifugal casting. The blanks obtained by the semi-liquid rolling method possess an σ_b, which is by 10-30% higher than that of the blanks manufactured by the centrifugal casting

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SOV/137-59-1-1550

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 1, p 207 (USSR)

AUTHORS: Severdenko, V. P., Pasechnyy, S. A.

TITLE: The Effect of Roll Diameter on the Resistance to Deformation During Cold Rolling of Sheet Steel (Vliyaniye diametra valka na soprotivleniye deformatsii pri kholodnoy prokatke stal'nykh listov)

PERIODICAL: Sb. nauchn. tr. Fiz.-tekhn. in-t AN BSSR, 1958, Nr 4, pp 52-63

ABSTRACT: In order to determine the resistance to deformation (D) of metal during small reductions, the elastic D being taken into consideration, experimental rolling of strips of 08FKP steel, with dimensions of 0.92 (± 0.01) x 150 x 400 mm, was carried out on rolling mills with rolls (R) 45, 100, 150, 200, 450, and 700 mm in diameter. The pressure of the metal against the R's was measured with the aid of dynamometers equipped with wire resistance strain gages. In computing the resistance to D, the length of the contact arc was determined from the flattening of the R's with the aid of the Hitchcock formula. It was established that as the R diameter is increased the effects of external friction become more prominent and the total pressure and the resistance of the metal to D are increased.

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The Effect of Roll Diameter on the Resistance to Deformation (cont.)

At small degrees of reduction (e.g., during cold rolling prior to pickling operations) the resistance to D of 08FKP steel diminishes considerably owing to a reduction in σ_s . As the D is increased, the σ_s value increases continuously and approaches that of $\sigma_?$ [Trans. Note: Subscript illegible] .

P. G.

Card 2/2

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SOV/137-59-1-1561

Translation from: Referativnyy zhurnal. Metallurgiya, 1959, Nr 1, p 208 (USSR)

AUTHORS: Severdenko, V. P., Pasechnyy, S. A.

TITLE: The Effect of Temper Rolling on the Duration of the Pickling Process and on the Surface Quality of Sheet Steel (Vliyaniye dressirovki na prodolzhitel'nost' travleniya i kachestvo poverkhnosti stal'nykh listov)

PERIODICAL: Sb. nauchn. tr. fiz.-tekhn. in-t AN BSSR, 1958, Nr 4, pp 83-88

ABSTRACT: Investigations dealing with the effects of temper rolling (TR) on the duration of the pickling (P) process and the surface quality of the metal were carried out on steel sheets of the 08kp grade. TR was accomplished in one pass on a four-high rolling mill with rolls 420/1200x1680 mm in diameter, the reduction amounting to 2-6%. P was performed in a 10% H_2SO_4 solution at a temperature of 95°C. A reduction of 2-4% was found to be most effective in reducing the time required for P. Compared with steel sheets which had been subjected to P only, steel sheets which had been temper-rolled prior to P exhibited a better surface finish. Employment of TR enhances the quality of the surface finish, particularly if the reductions are small. P practically does not affect the mechanical properties of

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The Effect of Temper Rolling on the Duration of the Pickling Process (cont.)

cold-rolled sheets, although in most instances the σ_s and σ_b values of cold-rolled sheets are somewhat greater after P. Natural aging over a period of 4 months produces a marked increase in hardness and in values of σ_s and σ_b, and is accompanied by a reduction in the value of δ.

P.G.

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SEVERDENKO, V.P.; MAKAREVICH, A.I.

Distribution of normal stresses in the housing of annular dies.
Inzh.-fiz.zhur. no.4:60-66 Ap '58. (MIRA 11:7)

1.Fiziko-tekhnicheskiy institut AN BSSR, g.Minsk.
(Dies (Metalworking))

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P., akademik; ZHILKIN, V.Z., inzh.

Drawing of titanium wire. Mash.Bel. no.5:19-28 '58.
(MIRA 12:11)

1. AN BSSR (for Severdenko).
(Wire drawing) (Titanium)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; FEDOROV, L.I.

Rate of metal shifting on contact surfaces caused by transverse rolling. Inzh.-fiz. zhur. no. 6:56-63 Je '58. (MIRA 11:7)

1. Fiziko-tekhnicheskiy institut AN BSSR, Minsk i Institut tsvetnykh metallov i zolota im. Kalinina, Moskva.
(Rolling(Metalwork))

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

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SOV/137-59-7-16082

18.7200

Translation from: Referativnyy zhurnal, Metallurgiya, 1959, Nr 7, p 262 (USSR)

AUTHORS: Severdenko, V.P., and Yegorkina, N.D.

TITLE: Steel-Bronze "AZh9-4" Bimetal

PERIODICAL: Sb. nauchn. tr. Nauchno-tekhn. o-vo tsvetn. metallurgii, Mosk. in-t tsvetn. met. i zolota, 1958, Nr 29, pp 227 - 251

ABSTRACT: "AZh9-4" steel-bronze bimetal was obtained by casting molten bronze on a steel blank placed into a graphite mold, heated up to 970 - 1,000°C. The bronze temperature was 1,200 - 1,220°C. The steel blank was heated-up together with the mold. The cohesion of layers was firm; lamination was not observed neither in turning cylindrical ingots on a lathe with eccentricity nor in destruction along the diameter under a press. The strong connection of metals was obtained by diffusion of bronze (Al and Cu) in steel and by steel diffusion in bronze; chemical analyses of the bronze layer at a 1.3 - 1.5 mm distance from the layer boundary proved increased Fe-percentage, which was twice as high as the initial content. Hot rolling of 12 x 26 x 100 mm and of 13 x 50 x 100 mm bimetal ingots revealed that the relative shrinkage of bronze was higher than that of

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

Steel-Bronze "AZh9-4" Bimetal

SOV/137-59-7-16082

steel and of the total relative shrinkage of the bimetal. The average specific bimetal pressure on the rollers as a function of shrinkage, was between the average specific pressure for steel and bronze. Bimetal expansion had a middle value between steel and bronze expansion. In cold rolling relative shrinkage of steel in the bimetal was higher than the relative bronze shrinkage and than the total relative shrinkage. "AZh9-4" bronze can be subjected to rolling in a cold state up to 30% shrinkage (in one pass); bimetallic strips of the same dimensions were subjected to high shrinkage rolling without destruction of the bronze constituent. Pipe ingots can be rolled, without occurrence of lamination, in hot state on grooved rollers (with a long mandrel or without it) and on a piercing mill with a mandrel; all-bimetal ingots can be rolled on a piercing mill (with or without a mandrel). In cold state pipe blanks can be rolled by the reduction method on grooved rolls.

P.G.

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PHASE I BOOK EXPLOITATION SOV/3756

Severdenko, Vasiliy Petrovich, and Leonid Ivanovich Fedorov

Prokatka v mashinostroyenii (Rolling in Machine Building) Minsk, Izd-vo AN BSSR, 1959. 172 p. 2,000 copies printed.

Sponsoring Agency: Akademiya nauk Belorusskoy SSR.

Ed. of Publishing House: L. Mariks; Tech. Ed.: I. Volokhanovich.

PURPOSE: This book is intended for technical personnel engaged in the machine-building industry.

COVERAGE: The authors present a theoretical and experimental treatment of cross rolling, by which term they designate the rolling method in which parallel rolls rotate in the same direction. Special installations and equipment are described, as well as the nature of the metal flow in cross rolling, metal pressure on rolls, nonuniformity of deformation in cross rolling, and the forming of nonround cross sections. The authors present results of investigations carried out during the development and experimental testing of what they describe as a new method of pressworking with simul-

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taneous electrical heating of work. No personalities are mentioned. There are 45 references: 44 Soviet and 1 German.

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are mentioned. References follow most articles.

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; PASECHNYY, S.A.

Irregularity of deformation throughout the thickness of sheets rolled at low compressions. Dokl. AN BSSR 3 no.4:154-156 Ap '59.
(MIRA 12:10)

(Sheet steel)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; PASECHNYY, S.A.

Effect of roller diameter on the mechanical properties of low-carbon steel rolled under low pressure. Dokl. AN BSSR 3 no.6:253-256 Je '59. (MIRA 12:10)

(Rolling (Metalwork))

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; MEKHED, I.N.

Plasticity of steel during induction heating. Dokl. AN BSSR 3 no.7: 303-305 Jl '59. (MIRA 12:11)
(Steel)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; PASECHNYY, S.A.

Intragranular deformation along the line of yield. Dokl.AN BSSR 3 no.9:375-377 S '59. (MIRA 13:2)
(Deformations (Mechanics))

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P., akad.; MURAS, V.S., kand.tekhn.nauk

Pressing thin-walled steel pipes and shaped sections at temperatures near the solidus. Mash.Bel. no.6:49-51 '59. (MIRA 13:6)

1. Akademiya nauk BSSR (for Sverdenko).
(Drawing (Metalwork))

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S/137/60/000/010/013/040
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 10, p. 115, # 23315

AUTHORS: Severdenko, V.P., Pasechnyy, S.A.

TITLE: Rolling of Low Carbon Sheet Steel With Low Reduction

PERIODICAL: Sb. nauchn. tr. Fiz-tekhn. in-t, AN BSSR, 1959, No. 5, pp. 3 - 38

TEXT: The authors investigated the effect of a rolling instrument during skin pass rolling, on the internal strained state of low carbon sheet steel. They studied the nature of the formation of lines of flow and compared the nature of deformation when stretching annealed and skin pass rolled metal. The effect of rolling conditions on changes in the mechanical properties and on aging was also investigated.

A.R.

Translator's note: This is the full translation of the original Russian abstract.

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

S/137/60/000/010/017/040
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No. 10, p. 126, # 23455

AUTHORS: Severdenko, V.P., Prosvirov, N.T., Yushkov, A.V.

TITLE: The Effect of the Flare Groove Shape on the Wear Resistance of Open Dies

PERIODICAL: Sb. nauchn. Fiz-tekhn. in-t, AN BSSR, 1959, No. 5, pp. 70 - 76

TEXT: An analysis is made of thermomechanical factors assuring the durability of dies. It is experimentally shown that in the existing shapes of the flare groove the bridge is subjected to high stresses and heating up to high temperatures. To raise the wear resistance of open swaging dies, a new V-shaped flare groove is recommended. The industrial use of dies with such a groove showed that their durability had increased by a factor of 1.5 - 2.

M.Ts.

Translator's note: This is the full translation of the original Russian abstract.

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

On the size of flash in open drop-forge dies

S/123/61/000/006/008/020
A004/A104

Plant) reduced the non-productive metal losses in flashes by 400 tons/year. There are 4 figures.

Ya. Golombik

[Abstractor's note: Complete translation]

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

S/137/60/000/010/018/040
A006/A001

Translation from: Referativnyy zhurnal, Metallurgiya, 1960, No.10, p.129, # 23498

AUTHORS: Severdenko, V.P., Zhilkin, V.Z.

TITLE: Determination of Specific Pressure During Drawing

PERIODICAL: Sb. nauchn. tr. Fiz.-tekhn. in-t, AN BSSR, 1959, No.5, pp. 59-65

TEXT: For the purpose of determining the specific pressure when drawing ВТ1-Д (VT1-D) alloy wire, a draw plate was manufactured consisting of 2 halves fastened to each other with tie bolts. Wire indicators were fixed to the bolts, used to determine the radial constituent of normal pressure on the draw plate wall. Drawing of the wire was made on a tearing machine where the draw plate was fastened with the aid of a special device. A dynamometer, representing a socket with wire indicators glued on its walls, was mounted on this machine for the measurement of the drawing forces. It is shown by experiments that the specific pressure increases with a decreased reduction and with a higher degree of preliminary deformation.

A.R.

Translator's note: This is the full translation of the original Russian abstract.

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

24 (6)

AUTHORS: Severdenko, V. P., Academician, AS BSSR, Kolos, V. I. SOV/20-126-5-14/69

TITLE: On a Field of Slide Lines (Ob odnom pole liniy skol'zheniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 5, pp 964 - 965 (USSR)

ABSTRACT: The solution of practical problems arising from the theory of plasticity frequently involves fields of slide lines similar to that shown by figure 1. In this case complicated numerical problems permit a solution of the problem; some particularities, however, offer a less complicated and more exact solution. A field is discussed in which families of lines originate from two centers O_1 and O_2, which intersect each other. The arcs originating from O_1 are assumed to have a common radius of curvature R, those originating from O_2 have a radius of curvature S, m lines originate from O_1 within the total angle α, and n lines from O_2 within the total angle β. These (curved) lines are separated from one another at O_1 by the angle $\Delta\alpha_i$ and at O_2

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by the angle $\Delta\beta_j$ (Fig 1). The authors then set up the line of the nodes $R_{m,n}$ and $R_{\alpha,\beta}$, which are transformed for an (xy)-coordinate system. Further, a formula is given for the simplified case in which $\alpha = \beta$. The authors evaluated the results numerically for a 15-degree net of lines, and the coordinates of the nodes, including the arcs of 135°, are listed in a table. The radii of the nodes are computed by the infinite series $R_{\alpha,\beta} = 1 + \frac{\alpha}{1!} + \frac{\alpha\beta}{1!1!} + \frac{\alpha^2\beta}{2!1!} + \frac{\alpha^2\beta^2}{2!2!} + \frac{\alpha^3\beta^2}{3!2!} + \ldots$. There are 1 figure, 1 table, and 2 Soviet references.

SUBMITTED: April 2, 1959

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

S/137/61/000/007/009/072
A060/A101

AUTHORS: Severdenko, V. P.; Kalachev, M. I.

TITLE: Experimental stress determination during pressure treatment of metals

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7,1961,2,abstract 7D7 ("Tr. Konferentsii: Tekhn. progress v tekhnol. prokatn. proiz-va". Sverdlovsk, Metalurgizdat, 1960, 17-26)

TEXT: Experimental methods are worked out for determining the principal stresses under manifold compression in the case of small and large deformations. The construction of a set-up is given by means of which the principal stresses at different points of the deformed volume may be determined. This set-up also makes it possible to simulate some processes of pressure treatment of metals. A compact measuring head - probe is used for the direct measurement of principal stresses inside the deformed body. A longitudinally bent platelet with small initial deflection is used as the stress measuring element. Foil sensors were glued onto this plate, thus making it possible to manage without an amplifier. Experiments in measuring the principal stresses were carried out upon Pb and Sn

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Experimental stress determination ...

specimens. The amount of deformation is ~ 1 percent at a deformation rate of 0.7 percent/min. The hydrostatic pressure for the Pb specimens varied between the limits of 4 - 18 kg/sq mm, for the Sn specimens - 7.5 - 12 kg/sq mm. Preliminary experiments have shown that the values of σ_s determined from the second plasticity condition by substituting the principal stresses in the corresponding formula differ from the actual values of σ_s.

Yu. Manegin

[Abstracter's note: Complete translation]

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

S/137/61/000/007/026/072
A060/A101

AUTHORS: Severdenko, V. P.; Pasechnyy, S. A.

TITLE: Rolling of sheet steel with small reductions

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1961, 8, abstract 7D51 ("Tr. Konferentsii: Tekhn. progress v tekhnol. prokatn. proiz-va". Sverdlovsk, Metallurgizdat, 1960, 464-475)

TEXT: The effect of skin pass rolling conditions (reduction, friction, roll diameter) upon strain resistance, distortion of the crystal lattice, non-uniformity of deformation and residual stresses was studied. The investigation was carried out upon rimmed low-carbon steel grade 08кп (08kp) (0.06 pc carbon) and 08Фкп (08F kp) (0.06 pc carbon, 0.06 pc V). The rolling took place on mills with roll diameters 45, 100, 150, 450, and 700 mm. It is explained that ageing of steel 08F kp has no great influence on the change in mechanical properties and upon the formation of a flow surface. Steel 08 kp is more subject to the influence of ageing. The σ_s of that steel increases most markedly during the first days of ageing, particularly for metal rolled with small reductions.

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A060/A101

Rolling of sheet steel with small reductions

The metal, skin pass rolled on small diameter rolls and with lubrication, is less subject to ageing than metal skin pass rolled on coarse rolls with large diameter. After long ageing flow lines also appear in metal skin pass rolled with large reductions.

Yu. Manegin

[Abstracter's note: Complete translation]

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; MAKAREVICH, A.I.

Stamping forgings with internal webs. Sbor.nauch.trud.Fiz.-tekh.inst. AN BSSR no.6:8-33 '60. (MIRA 14:6)
(Forging)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; MAKUSHOK, Ye.M.

Plotting the fields of lines of slide and calculating the coordinates of their nodal points for die-forging processes. Sbor.nauch.trud.Fiz.-tekh.inst.AN BSSR. no.6:34-45 '60. (MIRA 14:6)
(Plasticity)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; MAKUSHOK, Ye.M.

Studying strained state caused by the extrusion of metals in burrs.
Sbor.nauch.trud.Fiz.-tekh.inst.AN BSSR no.6:46-57 '60.
(Deformations (Mechanics)) (MIRA 14:6)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; GAVRILOV, M.Ye.; MAKUSHOK, Ye.M.; SEGODNIK, A.F.

Seamless forging with drop-forging crank presses. Sbor.nauch.trud. Fiz.-tekh.inst.AN BSSR no.6:58-65 '60. (MIRA 14:6)
(Forging)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; ZHILKIN, V.Z.

Determining the coefficient of external friction during drawing titanium. Sbor.nauch.trud.Fiz.-tekh.inst.AN BSSR no.6:66-73 '60. (MIRA 14:6)

(Drawing (Metalwork)) (Titanium)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

S/148/61/000/003/012/015
A161/A133

AUTHORS: Severdenko, V. P., Ankut, P.P.

TITLE: Recrystallization of 40 X (40Kh) steel during hot deformation

PERIODICAL: Izvestiya vysshikh zavedeniy. Chernaya metallurgiya, no. 3, 1961, 148 - 153

TEXT: The purpose of the described investigation was to study the effect of the temperature and the rate and degree of deformation on the size of recrystallized grain of 40 X (40Kh) steel. Its chemical composition is: 0.46% C, 1.08% Cr; 0.55% Mn, 0.32% Si, 0.030% P, 0.024% S. Specimens were prepared from round rolled bar stock 20 mm in diameter, normalized, and provided with threaded holes. Screws of the same 40Kh steel were screwed into the specimens, and the real deformation degree after upsetting was determined under the microscope by the changes of the screw pitch. The specimens were heated to 800 - 1,300°C. A thin decarbonized layer of metal separating the screw from the specimen body was clearly seen under the microscope, but at 1,300°C the metal welded together and the decarbonized layer became no more visible, and no data on the deformation distribution could be ob-

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

tained. The deformation distribution over the length of the specimens was extremely nonuniform, with the maximum in the center, and the minimum on the contact surfaces. It increased abruptly with the increasing distance from the contact surfaces. A slightly higher deformation was found at the specimen face where mica was put on. This indicates the effect of friction. The recrystallized grain was larger than the initial one with the exception of grains formed in the subcritical and the post-critical deformation range at 800°, when the grain size was the same as the initial one. The degree of deformation at a given temperature had a considerable effect on the grain size in the critical deformation range only. The critical deformation range boundaries for the 40Kh steel at different temperature are the following (in %):

Deformation temperature, °C	According to general recrystallization diagrams	According to real recrystallization diagrams
800	6 - 17	
900	4 - 14	5.5 - 20
1000	2.5 - 14	
1100	0 - 14	0 - 18
1200	0 - 10	
1300	0 - 10	0 - 16

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

The grains grew considerably at all deformation degrees with an increasing temperature, particularly in the ranges of 1,000 - 1,100 and 1,200 - 1,300°C. The recrystallization threshold shifted toward lower deformations when the temperature rose. At 1,100°C and up, no recrystallization threshold was discovered even at 1 - 1.5% deformation. It was therefore concluded that no minimum limit of critical deformation exists at this temperature. The shape of the real recrystallization diagrams was same as of the general diagrams, only the critical deformation range was somewhat wider, and the recrystallization threshold shifted slightly toward higher deformation. The following conclusions were drawn: 1) The maximum values of critical deformation in 40Kh steel within the 800 - 1300°C range, where the grain is growing, do not exceed 17% for general deformation and 20% for real deformation. 2) In the case of free upsetting within the investigated temperature range and a total deformation above 67%, the real deformations over the entire cross section area are higher than the deformations at which the grain is growing perceptibly. There are 2 figures, 1 table and 3 Soviet-bloc references.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN BSSR (Physicotechnical Institute of the AS BSSR)
SUBMITTED: September 13, 1960

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

82590

18.5100
18.8200

S/170/60/003/005/006/017
B012/B056

AUTHORS: Severdenko, V. P., Pasechnyy, S. I.

TITLE: Stress Distribution in Rolled Sheets Caused by Nonuniform Deformation Along the Thickness

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 5, pp. 67 - 73

TEXT: In the pressing of sheets frequently Chernov-Lyuders lines of slide form at points of large deformations, which are the traces of plastic shifts of the metal. Here, the character of the stress distribution of the first kind, caused by nonuniform deformation of the metal layers, as well as the character of the cross-sectional defects of the crystal lattice of low-carbon steel sheets rolled with small reductions of thickness are investigated. Steel sheets with 0.06% C and 0.3% Mn were used after cold rolling and recrystallization annealing (8 hours at 680°C). The stresses of the first kind were determined from the relation between the relaxation occurring at the removal of a metal layer and the deformation of the rest of the sample (Ref. 9). From Fig. 1 it

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

Stress Distribution in Rolled Sheets Caused by Nonuniform Deformation Along the Thickness

S/170/60/003/005/006/017
B012/B056

may be seen that in the course of rolling of sheets with a small decrease in thickness, complicated systems of residual stresses of the first kind occur. Stresses of the second kind are determined by the X-ray method, for which purpose formula (4) and a method developed by G. Kurdyumov and L. Lysak (Refs. 10,11) were used. The determination of both kinds of stresses is described. Fig. 2 shows the cross-sectional nonuniform distortion of the crystal lattice after rolling with different decrease in thickness is shown. The degree of cross-sectional nonuniformity of deformation was determined by measuring the microhardness over the cross section of the sheets rolled with different decreases of thickness. On the basis of experiments on annealed metal it was found that the most stable recordings were obtained from a load of 200 g, whereas the least stable recordings were obtained from 5 g. From Fig. 3 it may be seen that the microhardness in the surface layers is greater than in the inner layers, which may be explained by the considerable solidification of the surface layers. A structural analysis of the annealed samples confirmed the cross-sectional nonuniform deformation of the sheets. In samples deformed with a 1-2% decrease of thickness, large grains form after recrystallization annealing. The

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

82590

Stress Distribution in Rolled Sheets Caused by Nonuniform Deformation Along the Thickness

S/170/60/003/005/006/017
B012/B056

microstructure of such a sample is shown in Fig. 4. In the case of decreases of more than 2-3%, large grains cover the whole rolled stock. In this case, deformation is more uniform. It was found that at thickness decreases of more than 0.4%, the yield line corresponding to an elongation of 7.6% vanishes. An explanation is given for the decrease of the yield point observed within the range of small decreases of thickness (~ 1.0%). It is presumed that in the dressing of sheets, the major part of dislocations in all grains of the rolled stock is liberated from blocking impurity atoms. The yield lines observed in the case of thickness decreases of up to 0.4% proves the capability of the metal of becoming deformed if the load remains unchanged. There are 4 figures and 13 references: 10 Soviet and 3 US.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN BSSR, g. Minsk (Institute of Physics and Technology of the AS BSSR, Minsk)

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APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

Severdenko, V.P.

S/170/60/003/008/011/014
B019/B054

AUTHORS: Severdenko, V. P., Makushok, Ye. M.

TITLE: Experimental Determination of the State of Stress by Pressing Metal in a Burr

PERIODICAL: Inzhenerno-fizicheskiy zhurnal, 1960, Vol. 3, No. 8, pp. 88 - 91

TEXT: The authors deal with a method of measuring the pressure in the interior of forged pieces; the method had been described before by Makushok (Ref. 1). The pressure curve on the end face of the forged piece is measured by means of a plate which has a number of holes. The pressure on the lateral faces was measured by transmitters which were arranged in spirals with respect to the end face of the punch. The measuring operations are thoroughly described with the aid of the scheme in Fig. 1. Fig. 2 graphically shows the results of an experimental determination of the distribution curve of normal stresses during the pressing of lead. The stress distribution on the end face of the forged piece is similar to that in the plane of the burr whereas the stress on the lateral faces of the

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

Experimental Determination of the State of Stress by Pressing Metal in a Burr

S/170/60/003/008/011/014
B019/B054

punch depends on the height of the burr slits. A comparison of the results shows that with a considerable height of the burr slits there are differences between the specific pressures on the lateral and end faces. On a reduction of this height, this difference is reduced by an increase in hydrostatic pressure. There are 2 figures and 1 Soviet reference.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN BSSR, g. Minsk (Institute of Physics and Technology of the AS BSSR, Minsk)

SUBMITTED: March 3, 1960

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APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; MAKUSHOK, Ye.M.

Fields of slip lines in metal forced out into a flange. Dokl. AN BSSR 4 no.1:24-27 Ja '60. (MIRA 13:6)
(Forging)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

S/148/60/000/004/002/006
A161/A029

AUTHORS: Severdenko, V.P., Voyachek, Ye.S.

TITLE: Investigation of the Friction Coefficient in Rolling

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - Chernaya metallurgiya, 1960, No. 4, pp. 109-112

TEXT: The friction coefficient of steel was studied within the range from room temprature to 1,300°C by measurements of the lead value and the relation between the grip angle, friction angle and critical angle in rolling. Four carbon and alloy steel grades were used - 20", 35", 40 X (40Kh) and 18XГТ (18KhGT). The experimental rolling mill was a two-high mill with ground steel rolls of 210 mm in diameter. The results are shown in curves of complex shape with two peaks. Though peculiar metal behavior in the range of 450-500°C and at 700°C had been observed before (Ref. 3,4) and in a work guided by S.I. Gubkin, the first peak of the curves at 450-550°C was revealed for the first time. The phenomenon is explained by the chemical composition of scale. At high temperature it consists of three layers, viz., Fe_2O_3 on the top, Fe_3O_4 in the middle and FeO on the metal. FeO is stable up to 570°C. Alloying ele-

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Investigation of the Friction Coefficient in Rolling

ments may lower or raise this limit. Below the stability range of FeO the scale has two layers - Fe_2O_3 on top, and Fe_3O_4 on the metal. The rapid rise of the curves from 300°C and the first peak are apparantly due to the formation of an oxide film sticking to the metal and to deformation resistance of rolled metal which is only slightly changed below 600°C; the dip at 600-700°C is caused by dropping deformation resistance and weak oxidation in this range, and has a sharply defined limit for each steel grade. This limit may be the point of the appearance of FeO in scale. Then oxidation becomes intense and friction and lead rise to the second peak. From 900-1000°C the oxidation rate drops (this had been stated also in Ref. 6), and at still higher temperature softening scale may form a "lubricant." There are 3 figures and 6 Soviet references.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN BSSR (Institute of Physics and Engineering of AS BSSR)

SUBMITTED: July 23, 1959

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P., doktor tekhn.nauk; ASTAKHOV, I.G., kand.tekhn.nauk

Use of radioactive isotopes to study certain phenomena occurring during the plastic deformation of steel. Sbor.Inst. stali no.39:153-160 '60. (MIRA 13:7)

1. Kafedra prokatki Moskovskogo ordena Trudovogo Krasnogo Znameni instituta stali im. I.V.Stalina.
(Deformations(Mechanics))
(Radioisotopes--Industrial applications)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P., MEKHED, I.N.

Effect of temperature of deformation on the properties of steel.
Dokl.AN BSSR 4 no.7:295-297 Jl '60. (MIRA 13:8)

1. Fiziko-tekhnicheskiy institut AN BSSR.
(Steel--Thermal properties)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; MAKUSHOK, Ye.M.

Experimental determination of strain when a metal is forced into a burr. Inzh.-fiz.zhur. no.8:88-91 Ag '60. (MIRA 13:9)

1. Fiziko-tekhnicheskiy institut AN BSSR, g. Minsk.
(Deformations (Mechanics))
(Pressure--Measurements)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

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PHASE I BOOK EXPLOITATION SOV/4782

Moscow. Institut stali

Proizvodstvo i obrabotka stali i splavov (Production and Treatment of Steel and Alloys) Moscow, Metallurgizdat, 1960. 462 p. (Series: Its: Sbornik, 39) 2,100 copies printed.

Ed.: Ye. A. Borko; Ed. of Publishing House: S. L. Zinger; Tech. Ed.: M. R. Kleynman; Editorial Council of the Institute: M. A. Glinkov, Professor, Doctor of Technical Sciences; R. N. Grigorash, Docent, Candidate of Technical Sciences; V. P. Yelyutin, Professor, Doctor of Technical Sciences; A. A. Zhukhovitskiy, Professor, Doctor of Chemical Sciences; I. N. Kidin, Professor, Doctor of Technical Sciences; B. G. Livshits, Professor, Doctor of Technical Sciences; A. P. Lyubimov, Professor, Doctor of Technical Sciences; I. M. Pavlov, Corresponding Member, Academy of Sciences USSR; and A. N. Pokhvisnev, Professor, Doctor of Technical Sciences.

PURPOSE: This book is intended for technical personnel in industry, scientific institutions and schools of higher education, dealing with open-hearth and electric-furnace steelmaking, metal rolling, physical metallurgy, metallography, and heat treatment. It may

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also be used by students specializing in these fields.

COVERAGE: The book contains results of theoretical and experimental investigations of metallurgical and heat-engineering processes in open-hearth and electric furnaces. Data are included on the following: desulfurizing of pig iron outside the blast furnace, interaction of oxides of the carbide-forming metals with solid carbon, the change of content of gases in the bath of the open-hearth furnace in various periods of melting, intensification of the electric melting of steel, etc. Other articles deal with the nonuniformity of deformation in rolling, the study of the continuous rolling process, the dependence of the friction—slippage coefficients in rolling on a number of factors, and other problems in the pressworking of metals. Articles on physical metallurgy and the theoretical principles and techniques of the heat treatment of steel are also included. No personalities are mentioned. References accompany most of the articles. There are 207 references, both Soviet and non-Soviet.

Card 2/10

Pavlov, I. M., and P. I. Davidkov, Candidate of Technical Sciences [Department of Rolling]. Relationship Between Friction Coefficient and [Surface] Smoothness of Rolls in Cold Rolling 113

Polukhin, P. I., I. G. Astakhov, Candidate of Technical Sciences, A. I. Solov'yev, Engineer, and Yu. Ye. Romenko, Engineer [Department of Rolling]. Investigation of the Process of Continuous Rolling of Steel Angles 132

Severdenko, V. P., Doctor of Technical Sciences, and I. G. Ar[illegible] of Rolling]. Application of Radioactive Isotopes for Studying Certain Phenomena Taking Place in Plastic Deformation of Steel 153

Pavlov, I. M., and A. V. Krupin, Candidate of Technical Sciences [Department of Rolling]. Effect of the Orientation of Defects in Metal on the Stress Concentration 161

Potapkurev, M. N., Candidate of Technical Sciences [Department of Rolling]. Slippage in Rolling 173

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APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

S/123/61/000/003/012/023
A004/A104

AUTHORS: Severdenko, V. P.; Prosvirov, N. T., and Kovylyayev, N. P.

TITLE: Small-flash die-forging and the calculation elements of small-flash dies for body of revolution blanks

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 3, 1961, 7, abstract 3V48 ("Sb. nauchn. tr. fiz.-tekhn. in-t AN BSSR", no. 5, 1959, 66-69)

TEXT: The authors describe the advantages of small-flash die-forging over flashless forging and die-forging in open dies. They present the calculation elements for small-flash dies. There is 1 figure and 1 reference.

Ya. Golombik

[Abstractor's note: Complete translation]

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APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

SEVERDENKO, V.P.; PASECHNYY, S.A.

Distribution of stresses in rolled sheets caused by nonuniform deformation along the thickness. Inzh.-fiz.zhur. no.5:67-73 My '60.
(MIRA 13:8)

1. Fiziko-tekhnicheskiy institut AN BSSR, Minsk.
(Deformations (Mechanics)) (Strains and stresses)

APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8"

"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

S/571/60/000/006/002/011
E193/E383

AUTHORS: Severdenko, V.P. and Makarevich, A.I.

TITLE: Stamping of internally-webbed forgings

SOURCE: Akademiya navuk Belaruskay SSR. Fiziko-tekhnicheskiy institut. Sbornik nauchnykh trudov. no. 6. Minsk, 1960. 8 - 33

TEXT: An internally-webbed ring (driving flange .) is one of the most common shapes produced by drop-forging. Since the web accounts for the bulk of material used up in the fabrication of components of this type, the general trend is to reduce its thickness. A decrease in the web thickness, however, can be attained only at the price of increased forging pressure, intensified tool wear and an increased proportion of faulty forgings. Since no fundamental studies of drop-forging of internally-webbed components have been reported in the literature, the optimum web thickness is usually calculated from empirical formulae, in which the geometry of the forgings only is taken into account. Hence the present investigation - whose object was to relate the geometry of the part under consideration to

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deformation and flow of the metal, contact friction, stress distribution and heat-transfer during the process studied with a view to developing a method of determining the optimum web thickness. The first chapters of the article are devoted to an analysis of results of earlier studies (Ref. 6 - A.I. Makarevich - Sb. nauchnykh trudov FTI AN BSSR, no. 4, izd. AN BSSR, 1958) of metal flow in internally-webbed forgings which are correlated with the experimental results reported in the remaining part of the paper. The conclusions reached can be summarised as follows.

1) A characteristic feature of forging of internally-webbed components is non-uniform distribution of the stress and deformation, both in the web and at the mouth of the flash clearance (gutter). The general laws governing the flow of metal in round, symmetrical forgings apply also to internally-webbed rings.

2) In calculating the forging force, pressure due to deformation of metal between the top and bottom punches (fullers') has to be taken into account in addition to that set up in the annular part

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(rim) of the forging.
3) The flow of metal is confined mainly to the inner layers of the web. Consequently, wear of the punch due to movement of the metal relative to the tool surface is insignificant.
4) In the absence of work-hardening, the specific contact friction force, f , increases initially with increasing normal stress, σ_n , and then reaches a constant limiting value of $f_{max} = 0.5\ p_T$, where p_T is the yield strength of the alloying. This is illustrated in Fig. 2, where f (kg/mm^2) is plotted against σ_n (kg/mm^2), Curves 1 and 2 in graph A relating to lead and tin, Curves 1, 2, 3 in graph B relating to aluminium, copper and brass, respectively.
5) Non-uniform distribution of stresses normal to the die surface has been established. A, so-called, "indentation" method was used for this purpose. It consisted of drilling a number of blind holes in the working surface of the die in which hard alloy plugs were subsequently inserted with one end flush with the die surface and the other end, tapered to a point,

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pressed against a soft steel disc placed at the bottom of each hole. The maximum normal stress (i.e. that set up in the final stage of the forging operation) was determined from the size of the impression made by the pointed plugs in the steel discs. The results are reproduced in Fig. 3, where σ_n (kg/mm^2) is plotted against the distance (mm) from the die axis, the cross-section of the die being shown under each graph. The flash clearance in all the experiments was maintained constant at 2.2 mm. The curves in Fig. 3a represent results obtained for a die with a punch diameter d_4 = 40 mm, used to produce forgings with web thickness, h, ranging from 20 mm (bottom curve) to 2 mm (top curve); the curves in Fig. 3b represent results obtained for d_4 = 30 mm and h ranging from 15 - 2 mm.

6) The magnitude of σ_n at any point at a distance r from the die axis can be calculated from a formula derived by the present authors:

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Stamping of ....

$$\sigma_n = p_T \left[\frac{2\mu B + 4.8}{\delta} + 1.2 + \frac{2\mu}{h} (r_4 - r) \right] \qquad (4)$$

where μ is the friction coefficient,
p_T is the yield strength of the metal,
B is the thickness of the rim,
δ the flash clearance,
h web thickness and
r_4 web radius.

The accuracy of this formula is demonstrated in Fig. 5, showing the calculated (broken curve) and experimentally-determined (continuous curve) distribution of σ_n for a die with

$h = 2$ mm and $r_4 = 15$ mm.

7) The magnitude and distribution of σ_n depends on contact friction, as determined by the surface condition of the die. This is illustrated in Fig. 4, showing the distribution of σ_n

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

Stamping of ....

resultant from the use of dies with the flat face of the punch roughly machined, polished and lubricated (Curves 1-3), respectively.

8) High normal stresses in the central portion of the web cause a distortion of the punch and are the main cause of its excessive wear. The maximum value of σ_n for any given case can be calculated from formula (4). If this value is equated to the maximum stress, $p_{доп}$, to which the punch can be subjected without distoring, a formula for the minimum permissible web thickness is obtained in the form:

$$h = \frac{2\mu r_u \delta}{\left(\frac{p_{доп}}{p_T} - 1.2\right)\delta - (2\mu B + 4.8)} \qquad (8).$$

9) A reduction of σ_n and a correspondingly longer life of the die can be attained by increasing the thickness of the web

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"APPROVED FOR RELEASE: 08/23/2000 CIA-RDP86-00513R001548210020-8

Stamping of ....

in its central portion. It is for this reason that so-called "combined" forging is advocated by some workers. In this process, side-by-side with forging of the main internally-webbed component, another component situated in the central portion of the web is stamped. As a result, metal consumption is reduced because the internal part of the web is utilized and the secondary forging has no flash, the production capacity of the press is increased and manpower requirements are reduced.

10) The maximum σ_n increases rapidly with decreasing h/d_4 ratio, and the optimum diameter of the web corresponds to $h/d_4 = 0.2 - 0.1$.

11) Experiments described in the present paper were conducted at room temperatures. In industrial practice, the temperature of the web decreases rapidly with a corresponding increase in the temperature of the punches. With decreasing temperature, the resistance of metal to deformation increases and higher forging pressure are required whereby the life of the instrument is shortened. Since the flow of metal is confined mainly to the internal layers of the web, the temperature of this region is of

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practical importance. An approximate formula was derived by the present authors, from which the temperature, Θ_4, of the central layer of the web at any stage of a forging operation can be calculated. The formula has the form of:

$$\Theta_4 = 1 - \frac{1}{1 + K_\varepsilon}\left(\operatorname{erfc}\frac{H}{4\sqrt{a_1 \tau}} + \operatorname{erfc}\frac{h_x}{4\sqrt{a_1 \tau}}\right) \qquad (14)$$

where K_ε is a coefficient characterising the heat-conductivity of the web relative to the punch material,
H is the thickness of the blank,
τ time of contact between the web and the punch,
h_x the web thickness after time τ and
a_1 thermal diffusivity of the web material.

The validity of this formula was confirmed by experiment.

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The critical web thickness, $h_{кр}$, is that which will ensure that the temperature in the interior layers of the web at the final moment of the forging operation is not appreciably lower than the initial temperature of the blank. Based on the analysis of formula (14), a formula for $h_{кр}$ was derived in the form:

$$h_{кр} = 11.2 \sqrt{\lambda\tau/c\gamma} \qquad (16),$$

where λ is the heat-conductivity coefficient,
c specific heat and
γ the density of the web material.
There are 12 figures and 14 Soviet-bloc references.

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S/571/60/000/006/003/011
E193/E383

AUTHORS: Severdenko, V.P. and Makushok, Ye.M.

TITLE: Study of deformation of metal in forging with the formation of a flash

SOURCE: Akademiya navuk Belaruskay SSR. Fiziko-tekhnicheskiy institut. Sbornik nauchnykh trudov. no. 6. Minsk, 1960. 46 - 57

TEXT: Results of an investigationare reported in which the coordinate net techniquewasused to study the deformation accompanying the formation of a flash during forging of cylindrical lead blanks, 32, 50, 75 and 135 mm in diameter. The blanks were sectioned both horizontally and in the plane corresponding to the plane of symmetry of the flash and lead foil with the coordinate nets inscribed by a photographic process were placed between the component parts of each blank before the experiments. Two types of coordinate network used (orthogonal and radial) are shown in Figures 1 and 10, respectively, the vertical lines on the right-hand side indicating the axes of the blanks. At the intersection of the lines forming the coordinate networks, circles were

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Study of deformation of ....

inscribed whose shape changed during deformation, the degree of which was calculated from the dimensions of the axes of the resultant ellipses and from the displacement of the centre of each circle relative to a fixed reference line. The results of the first series of experiments in which blanks 75 mm in diameter were compressed in stages, the reduction in thickness attained in each consecutive stage being equal to the pitch, S , of the coordinate net (3.55 mm), are reproduced in Fig. 2, which shows how the deformation, ε , in the plane of symmetry of the flash clearance varied with the distance, R (mm), from the blank axis. The number ascribed to each curve indicates the flash thickness in multiples of S (e.g. Curve 4 represents results obtained for a blank forged to produce a flash 4 x 3.55 = 14.2 mm thick). It will be seen that as the flash thickness diminished, the deformation across the horizontal plane of symmetry of the blank became increasingly nonuniform due to rapid increase in the degree of deformation near the mouth of the flash clearance. Experiments carried out on blanks of different diameters, forged in steps of different magnitudes, yielded similar results, some

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of which are reproduced in Fig. 5, where the maximum deformation, ε, in the plane of symmetry of a blank 75 mm in diameter is plotted against the flash thickness (h_3, mm). The experimental results are represented by the continuous curve, the broken curves representing empirical functions:

$$\varepsilon = \ln \frac{h_{3.H}}{h_{3.K}} \qquad (2)$$

and

$$\varepsilon = \ln \frac{D}{4h_{3.K}} \qquad (3),$$

where D is the blank diameter, $h_{3.H}$ and $h_{3.K}$ denoting its initial and final thickness. It will be seen that the latter expression gives results which agree well with experiment. The results of further tests showed that the maximum deformation at the mouth of the flash clearance was a sum of the deformation due

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to metal flow and deformation due to compression of the layers adjacent to the plane of symmetry of the blank. Consequently, the empirical formula (3) becomes:

$$|\varepsilon|_{max} = \ln \frac{D}{4h_{3,K}} + 5 \frac{\Delta H}{D} \qquad (4),$$

where ΔH is the decrease in the blank thickness (it should be emphasised here that the volume of metal deformed to such an extent is small, being concentrated only at the mouth of the flash clearance). The extent of the deformation region is illustrated in Fig. 9, showing the slip-lines field in the vertical plane of symmetry of the blank, in the segment bounded by its axis (vertical broken line), horizontal plane of symmetry (axis of abscissae) and the die wall. The real boundary of the deformation region (line 3) is very close to the real boundary

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